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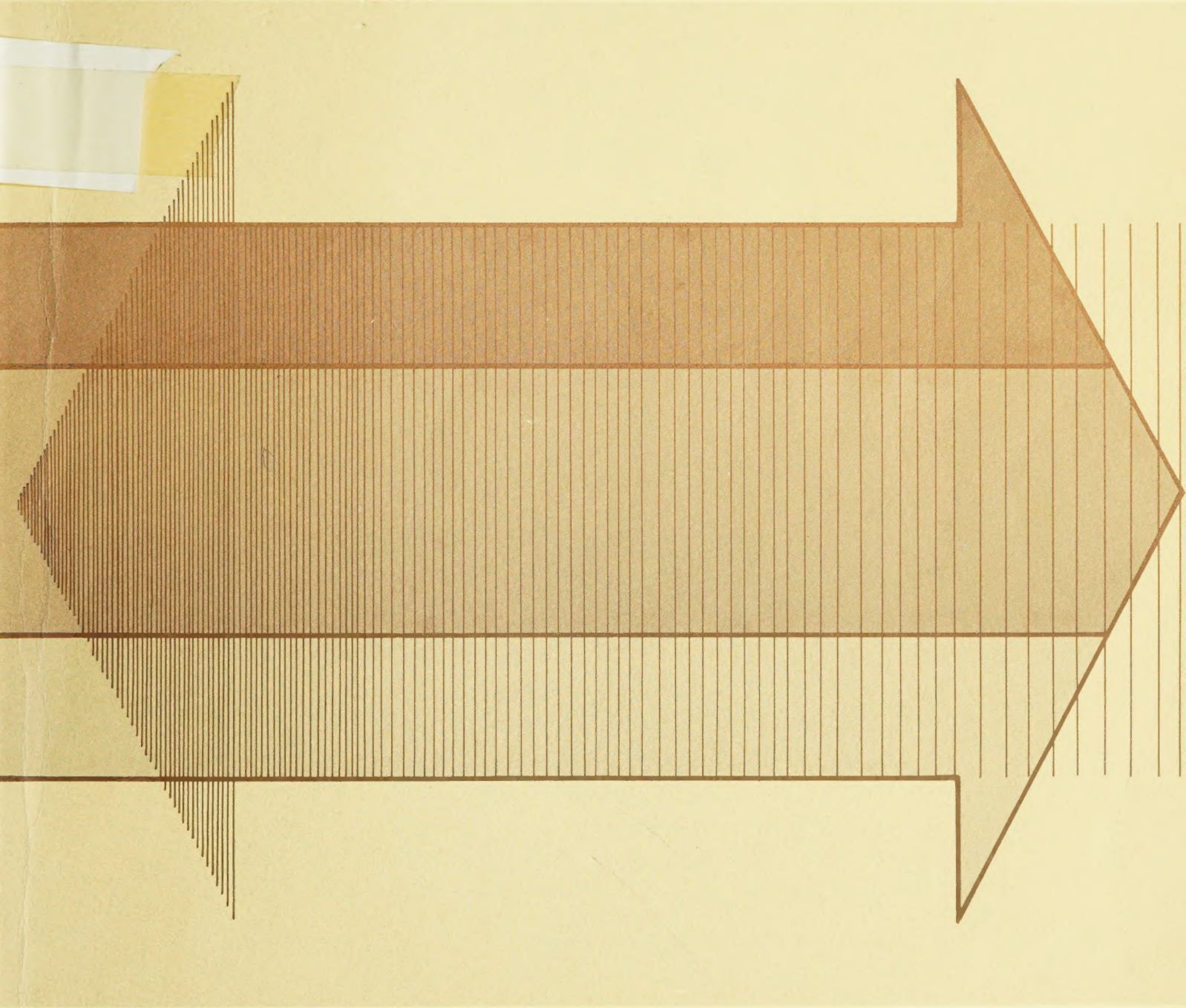
TRAFFIC CORDON COUNT PROGRAM '81



Planning and Development Department
Hamilton-Wentworth Region

February , 1982

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TRAFFIC CORDON COUNT PROGRAM 1981

PREPARED BY THE
PLANNING AND DEVELOPMENT DEPARTMENT
OF THE
REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH

FEBRUARY 1982

SUMMARY

The Cordon survey is a comprehensive traffic counting program conducted in the summer of 1981. The traffic count data is summarized by major traffic cordon, to give an overview of person, vehicle, and transit travel. In addition, the summaries are compared to past traffic count data to give an indication of changes in traffic over time.

FINDINGS

The following is a summary of the major findings of the study.

- Automobiles account for the overwhelming majority of vehicles on the road. Up to 95% of the vehicles crossing the inner city cordons are automobiles. Automobiles account for a lesser amount of the traffic (85%) at the outer cordons.

- Truck traffic has the greatest impact on the outer cordons. Both the numbers and the percentage of trucks are highest at the Regional boundary. Although the percentages and the numbers of trucks are lower in the inner-city cordons, the numbers are significant because of the type and design speed of roads on which trucks must operate and the visual and noise impact of the trucks on surrounding land uses.

- The average car has less than one-third of its seating capacity occupied. The auto occupancy in the Region averages between 1.31 and 1.48 persons per automobile; while most automobiles will accommodate from 4 to 6 persons depending on size and design. The majority of automobiles will never be completely occupied because of differences in trip purpose, destination and travel time by trip makers; but a small increase in car occupancy has the potential of removing many cars from the road. There is no evidence of a recent increase in automobile occupancy in response to higher vehicle and fuel costs.

- Transit plays a secondary role in transporting people in the Region. Even crossing the downtown corridor, where transit service is concentrated, only slightly over 20 per cent of the persons travel by transit. The importance of transit in transporting people diminishes with the distance from the downtown area.

- Traffic volumes have not been increasing over time across all cordons. Although traffic data shows a continuous increase in traffic volumes over time for the outer cordons, traffic volumes have decreased across the downtown cordon in the past five years. These trends have been calculated by adjusting past data from other sources to compare to the 1981 counts. Further monitoring is required to verify the trends.

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1.0 INTRODUCTION

The purpose of the Cordon Count program is to gather and analyze information on traffic and travel characteristics in the Hamilton-Wentworth Region. The intention is to conduct this type of survey on a regular basis in order to have a consistent and comparable data base, for use in the evaluation of the impacts of development and changes in travel characteristics on the need for transportation facilities and services.

Detailed information on traffic and transit characteristics is now collected independently by various agencies in the Region, for use in specific studies or for specific purposes. This information is valuable for the intended uses but does not supply the comprehensive overview that the cordon program is designed to provide; nor does it provide consistent time series data.

The Cordon Count survey in Hamilton-Wentworth is one of a number of similar surveys conducted by Regional Municipalities in southern Ontario. The combined information from these surveys provides Provincial transportation planners with an overview of the traffic and travel characteristics in this highly developed area of the Province. In recognition of the Provincial importance of the information from this survey, the Ministry of Transportation and Communications provided technical support and data processing facilities as well as funding for the survey work.

Information from the cordon count is summarized for 1981 and is compared to prior years in order to highlight changes in traffic and travel over time. Since this is the first year a comprehensive survey was done, data for previous years was obtained from various sources and converted into a format comparable to the 1981 cordon count information.

2.0 SURVEY METHODOLOGY

This survey summarizes traffic count data at a cordon level of detail. A cordon may be defined as an imaginary or physical boundary, encircling an area with distinct characteristics or significance. Traffic counts were conducted at each point where roads and/or transit services cross these cordons.

2.1 Cordon Locations

There are four primary cordons utilized for this study which were used to measure travel to and from:

1. Downtown Hamilton
2. Lower Central Hamilton
3. The urban areas of the Region
4. The Hamilton-Wentworth Region

These cordons are displayed in Exhibit 2.1 and are used as the basis for major data summaries in this report. Each cordon is comprised of a number of screenlines which are located where possible along natural or man-made boundaries, such as the escarpment, creek valleys, railways, municipal boundaries, etc. These screenlines were used to summarize cordon traffic in more detail where considered necessary.

Data was also collected for several secondary screenlines which further divide the large areas defined by the cordons. The purpose of these screenlines is to provide more detailed information on traffic flows within the areas contained by the cordons. This data is not included in the cordon summaries, but can be made available at a station or a screenline level of detail, when required.

The exact locations of the cordons and screenlines are described in Appendix A. To enable comparison with earlier studies, the study results have been summarized by screenline in Appendix H.

LEGEND

- CORDON NO 1
- CORDON NO 2
- CORDON NO 3
- CORDON NO 4

EXHIBIT 2.1

CORDON LOCATIONS

Planning & Development Department
Hamilton – Wentworth Region

2.2 Counting Stations and Procedures

A total of 113 stations was surveyed. These counting stations were located where major highways and arterials cross each cordon or screenline, and are displayed in Exhibits 2.2 A and 2.2 B, the latter being a detail map showing the Downtown Cordon. Appendix B contains a description of the location of each station, the date it was surveyed, and the cordon and/or screenline on which it is located.

The counts were conducted during the period May 4 to June 18, 1981. Each station was counted for one 17-hour period only, from 6:30 a.m. to 11:30 p.m., on a weekday from Monday to Thursday. Counts were not done Friday, Saturday or Sunday in order to avoid weekend traffic variations. The counts were done manually, using between one and six people at each station, depending on anticipated volumes of traffic.

The following information was recorded for each station:

1. Vehicle volumes
   - by direction: northbound, westbound, etc.
   - by 15 minute interval

2. Vehicle classification
   - autos by type: private autos and taxis
   - trucks by type: light, medium and heavy
   - buses by type: local diesel, trolley and other

3. Auto occupancy
   - private autos and taxis by occupancy: 1 to 6 people

4. Bus occupancy
   - buses by occupancy: 0-10, 11-20, etc.

A description of the method used for classifying vehicles, especially trucks, is contained in Appendix C.

2.3 External Data Sources

Several outside agencies provided data and assistance during the Cordon Count Survey.

The Regional Municipality of Halton was also conducting a cordon count survey in the summer of 1981 and, where possible, data was shared. Those stations for which Halton count data were utilized are indicated separately on Exhibit 2.2 A.

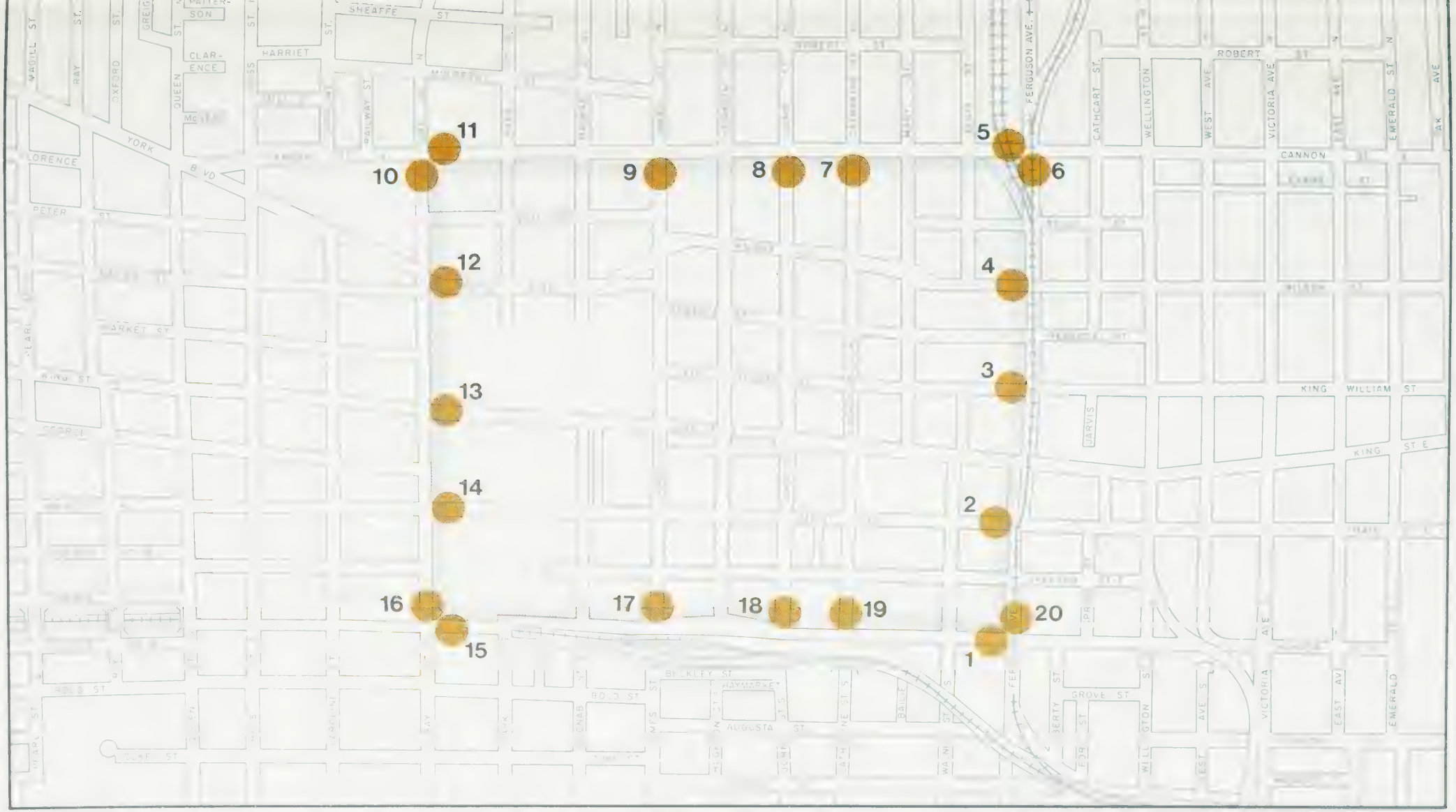
LEGEND

- HAMILTON-WENTWORTH SURVEY STATIONS
- HALTON SURVEY STATIONS

EXHIBIT 2.2 A

SURVEY STATION LOCATIONS - REGION

Planning & Development Department
Hamilton – Wentworth Region



LEGEND

- HAMILTON-WENTWORTH SURVEY STATIONS
- CORDON NO. 1

EXHIBIT 2.2B

SURVEY STATION LOCATIONS - DOWNTOWN

Planning and Development Department
Hamilton-Wentworth Region

The Toronto Area Transit Operating Authority (TATOA) provided bus occupancy information for GO buses into and out of Hamilton. This information was used to supplement bus volume and occupancy information from the survey.

The Hamilton Traffic Department provided 24-hour ATR count information for several roadways at the Halton Regional Boundary. This information was used to supplement and verify survey count information.

The Traffic Department and the Regional Engineering Department were sources for past traffic count data on roadways within the Hamilton area.

The Ministry of Transportation and Communications annual reports on traffic volumes on Kings' Highways served as sources for past traffic data on Provincial Highways. Past traffic count data was used for comparing changes in traffic patterns over time.

2.4 Recording and Data Processing

The counts were done manually using push button counting boards. Count totals were recorded for 15-minute intervals, in a format as illustrated in Appendix D.

Visual checks were done on the completed recording forms by field supervisory staff. The verified data was then keypunched on computer cards and loaded onto a computer tape file at the Downsview Ministry of Government Services Computer, where the data processing was carried out. Standard edit checks were carried out to identify data that was entered on the computer file incorrectly. Identified errors were corrected and then the data was sorted by station, time and direction, for ease of analysis.

Program 3306 of the Simplified Transportation Planning Computer Package (STPCP) was used to analyse the data. Specifically, the Standard Build and Standard Report options enabled the production of tabulations for vehicles and persons by station. The data was stored on computer file in the format of the Standard Data Bank, as shown in Appendix E. An example of the standard vehicle and person trip tabulations is included in Appendix F.

The vehicle and person tabulations done for each station and by 15 minute intervals, are available as background information to the study. The data was aggregated manually to screenlines and cordons for both the 17-hour period (6:30 a.m. to 11:30 p.m.), and for the p.m. peak hour (4:30 p.m. to 5:30 p.m.).

The p.m. peak hour, for the purposes of this report, is defined as 4:30 p.m. to 5:30 p.m. for all stations and cordons. This was used because it represented the average peak hour for all stations and coincides with the p.m. peak hour used in earlier studies. The actual hour of peak traffic flow varied slightly, by station and by direction of travel. Analysis of the survey data shows that by using the p.m. peak of 4:30 to 5:30 rather than the actual hour of peak traffic flow at each station, the outbound traffic volumes do not differ significantly (i.e. are within 2% of actual peak).

One notable area where the p.m. peak hour varies somewhat from the 4:30 p.m. to 5:30 p.m. average, is within the Bayfront Industrial area of Hamilton. Here, due to the large numbers of people who work shifts which either finish or start around 3:00 p.m., the actual peak hour occurs from 3:00 p.m. to 4:00 p.m. This fact was noted for several stations in the vicinity of Burlington Street and Gage Avenue, which are not contained in one of the four major cordons, but rather in a secondary screenline. At the major cordons used for the display summaries, traffic from the Bayfront area is generally combined with traffic from other areas, to produce the average peak hour of 4:30 p.m. to 5:30 p.m.

Information on a.m. peak hour volumes is available for all stations, as background data to the study. The a.m. peak hour was considered less important than the p.m. peak hour, since the latter has higher volumes and is used as the design hour. The average a.m. peak hour for all stations is 7:30 a.m. to 8:30 a.m., however, a great deal of variation among stations is displayed in the timing of the a.m. peak.

3.0 SURVEY RESULTS

Results are presented for the four major cordons shown on Exhibit 2.1. The data has been summarized to provide information on vehicle volume flows, person trip flows and travel characteristics, such as vehicle occupancy and percent transit usage. Data has also been summarized to show changes in traffic volumes between 1977 and 1981.

3.1 Vehicle Volumes

Table 3.1 indicates the number and percentage of autos, trucks and buses, for the 17-hour and p.m. peak hour periods, by cordon and direction. Exhibits 3.1 to 3.4 show the same information graphically, by direction of approach (i.e. north, south, east and west crossings are shown separately for each cordon). Separate exhibits show the 17 hour and the p.m. peak hour traffic flows for the downtown cordon and outer cordons.

The following observations were drawn from the analysis of vehicle volumes:

- The highest volumes are on Cordon 2, which is located around lower central Hamilton. A two-directional total of 325,828 vehicles were counted here over the 17-hour period. Volumes are slightly lower on Cordon 4 (the Regional Boundary) and Cordon 1 (Downtown Hamilton). The lowest volumes are on Cordon 3 (Urban Boundary), where a total of 191,191 vehicles were counted over the 17-hour period. Similarly, in the p.m. peak hour, Cordon 2 has the highest two-directional volume, with 32,234 vehicles, and Cordon 3 the lowest with 19,035 vehicles.

- Directional splits are approximately 50/50 outbound/inbound over 17 hours. They average 60/40 outbound/inbound in the peak hour, with a high of 66/34 for Cordon 2.

- P.M. peak hour volumes represent approximately 10% of the 17-hour volumes for all cordons.

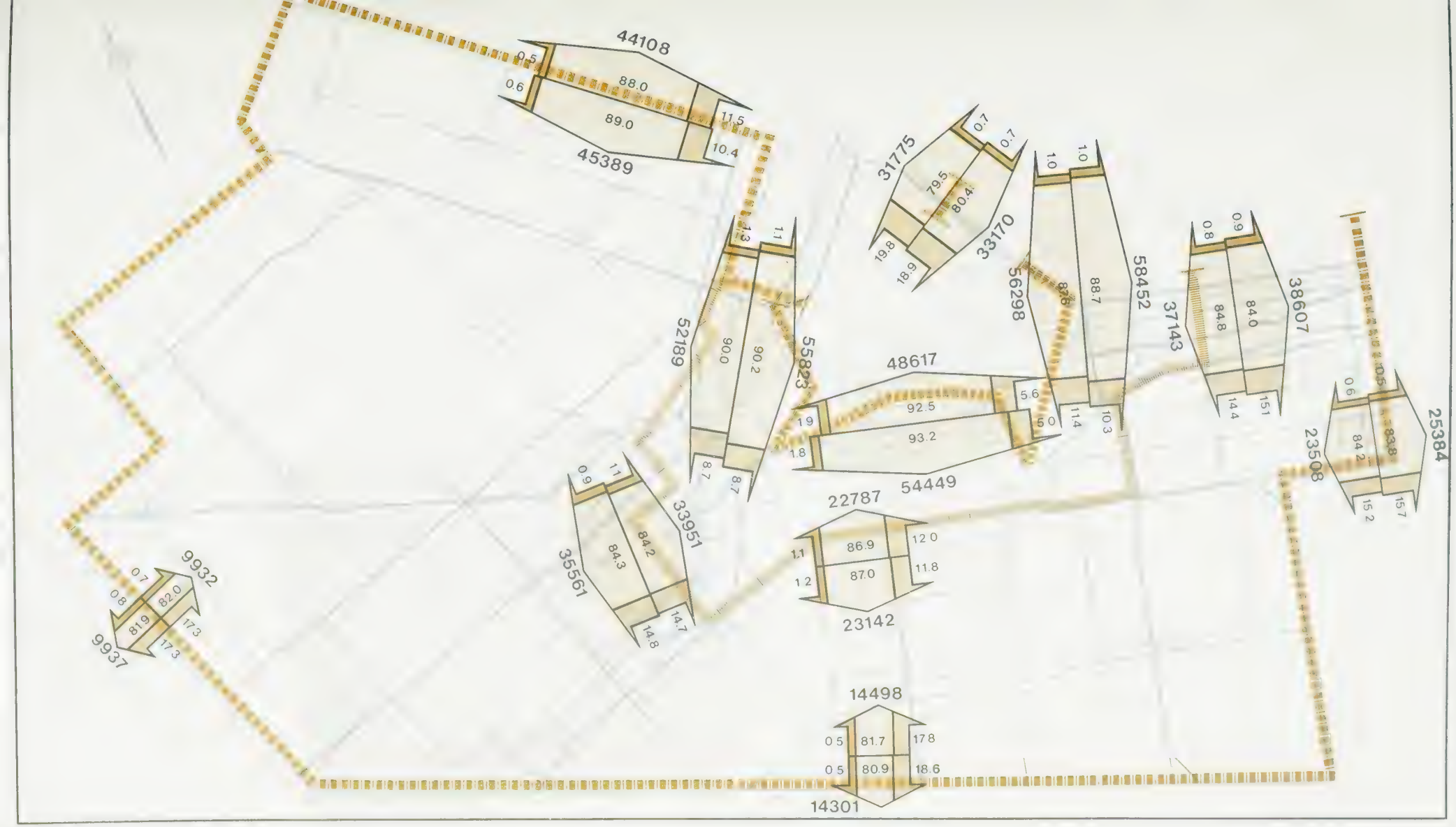
- Auto traffic makes up approximately 87% of cordon traffic volumes during the 17-hour period, and 93% during the p.m. peak hour, on average.

- Trucks represent an average of 11% of 17-hour total vehicle volumes, and 6% of p.m. peak hour volumes. The percentage of trucks is lowest for the downtown cordon and increases outward to the Regional Boundary.

TABLE 3.1

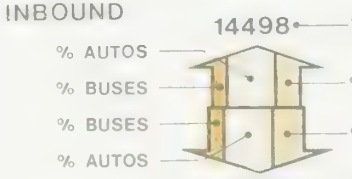
VEHICLE VOLUMES AND CLASSIFICATION BY CORDON

CORDON	DIRECTION	17 HOUR (6:30 a.m. - 11:30 p.m.)				P.M. PEAK HOUR (4:30 p.m. - 5:30 p.m.)			
		AUTOS	TRUCKS	BUSES	TOTAL	AUTOS	TRUCKS	BUSES	TOTAL
1	OUTBOUND	103,052	10,315	2,170	115,537	11,561	617	189	12,367
		(89%)	(9%)	(2%)	(100%)	(93%)	(5%)	(2%)	(100%)
	INBOUND	105,127	9,471	2,610	117,258	8,636	565	230	9,431
		(90%)	(8%)	(2%)	(100%)	(92%)	(6%)	(2%)	(100%)
2	OUTBOUND	149,588	13,318	2,184	165,090	20,116	871	187	21,174
		(91%)	(8%)	(1%)	(100%)	(95%)	(4%)	(1%)	(100%)
	INBOUND	144,588	14,049	2,101	160,738	10,150	732	178	11,060
		(90%)	(9%)	(1%)	(100%)	(92%)	(6%)	(2%)	(100%)
3	OUTBOUND	82,536	13,821	953	97,310	10,178	929	70	11,177
		(85%)	(14%)	(1%)	(100%)	(91%)	(8%)	(1%)	(100%)
	INBOUND	79,890	13,087	904	93,881	6,935	868	55	7,858
		(85%)	(14%)	(1%)	(100%)	(88%)	(11%)	(1%)	(100%)
4	OUTBOUND	105,060	19,707	738	125,505	12,447	1,298	48	13,793
		(84%)	(15%)	(1%)	(100%)	(90%)	(9%)	(1%)	(100%)
	INBOUND	106,852	18,877	766	126,497	9,635	1,414	57	11,106
		(84%)	(15%)	(1%)	(100%)	(87%)	(12%)	(1%)	(100%)



LEGEND

INBOUND

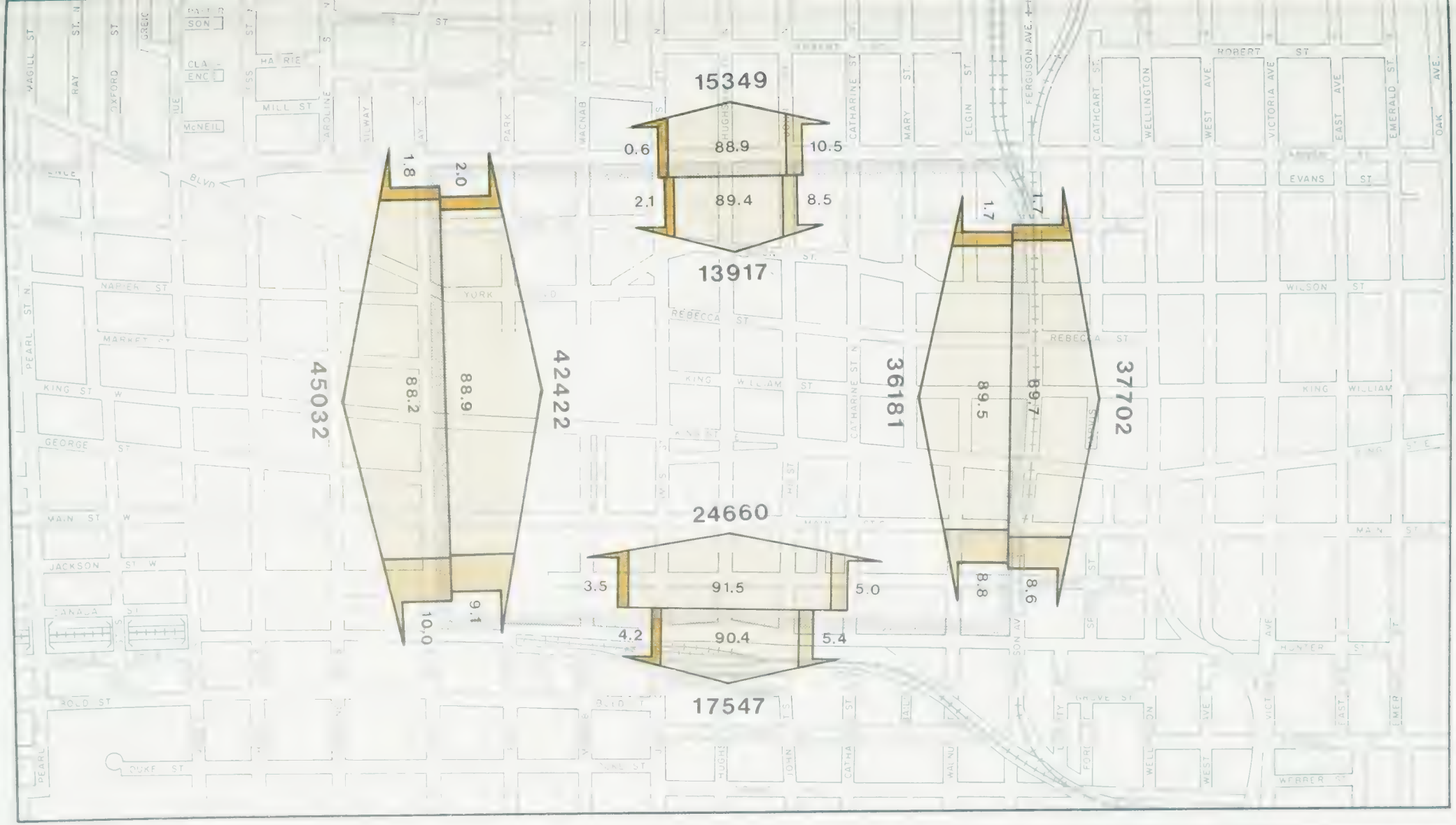


OUTBOUND

EXHIBIT 3.1

VEHICLES CROSSING OUTER CORDONS 6:30 A.M.-11:30 P.M.

Planning & Development Department
Hamilton – Wentworth Region



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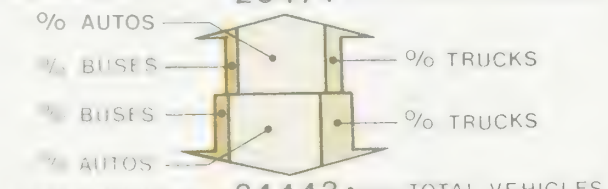


EXHIBIT 3.2

VEHICLES CROSSING DOWNTOWN CORDON 6:30 A.M.-11:30 P.M.

Planning and Development Department
Hamilton-Wentworth Region

LEGEND

INBOUND

2490 — TOTAL VEHICLES

% AUTOS

% BUSES

% BUSES

% AUTOS

% TRUCKS

% TRUCKS

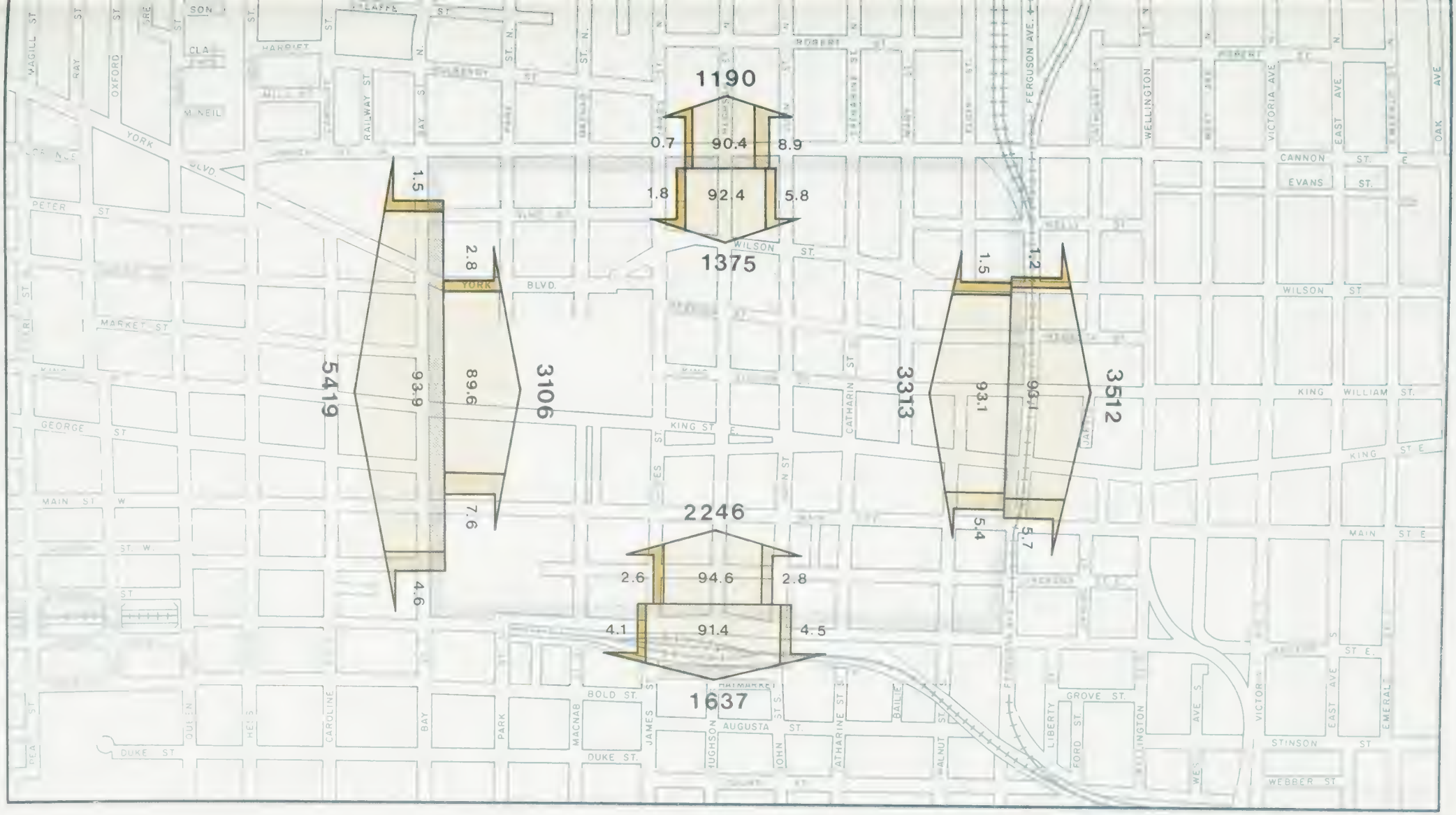
2645 — TOTAL VEHICLES

OUTBOUND

EXHIBIT 3.3

VEHICLES CROSSING OUTER CORDONS 4:30 P.M. - 5:30 P.M.

Planning & Development Department
Hamilton - Wentworth Region



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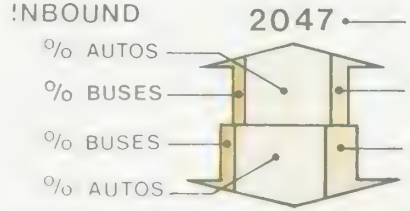


EXHIBIT 3.4

VEHICLES CROSSING DOWNTOWN CORDON 4:30 P.M.- 5:30 P.M.

Planning and Development Department
Hamilton-Wentworth Region

- o Buses represent only a minor portion of total vehicle traffic. Buses account for 2% of the traffic crossing the downtown cordon, and less than 1% of the traffic crossing the Regional boundary.

- o Taxis account for only a small portion of total vehicle traffic and, therefore, have been summarized along with auto vehicles, even though taxi data was collected separately. Taxis represent approximately 2% of vehicles for the downtown cordon, and less than 0.2% for the outer cordon.

3.2 Person Trip Volumes

The number of persons travelling has been summarized by cordon, direction and time period, and is shown in Table 3.2. Person trips are divided into trips by auto (private autos and taxis) and trips by transit (any type of bus). Exhibits 3.5 to 3.8 show the same information, graphically, by direction of approach.

The following observations were drawn from analysis of the person volume data:

- o The highest volume is on Cordon 2 with 466,583 person trips, and the lowest volume of 256,275 person trips is crossing Cordon 3.

- o The directional split averages 50/50 over the 17-hour count period and ranges up to 66/34 outbound/inbound at Cordon 2 in the p.m. peak hour.

- o P.M. peak hour person volumes in the outbound direction range from 14,276 persons at Cordon 3 to 30,408 persons at Cordon 2, and represent 10% of the 17-hour total persons at all cordons.

- o Persons using automobiles represent an average of 87% of all person trips. The percent of person trips using autos is lowest at Cordon 1 (Downtown Hamilton), and increases with distance from the downtown.

- o The percentage of persons travelling by transit is highest at the downtown cordon, where over 20% of trips are by transit. The Lower Central Hamilton Cordon also has fairly high transit use, with 13% of trips made by transit, while at the outer cordons, only 8% of persons use transit.

TABLE 3.2

PERSON VOLUMES AND CLASSIFICATION BY CORDON

CORDON	DIRECTION	17 HOUR (6:30 a.m. - 11:30 p.m.)			P.M. PEAK HOUR (4:30 p.m. - 5:30 p.m.)		
		AUTO PERSONS	TRANSIT PERSONS	TOTAL PERSONS	AUTO PERSONS	TRANSIT PERSONS	TOTAL PERSONS
1	OUTBOUND	142,140 (80%)	35,335 (20%)	177,475 (100%)	15,453 (77%)	4,698 (23%)	20,151 (100%)
	INBOUND	146,516 (79%)	39,196 (21%)	185,712 (100%)	11,458 (80%)	2,942 (20%)	14,400 (100%)
2	OUTBOUND	207,420 (88%)	30,993 (12%)	238,413 (100%)	26,313 (87%)	4,095 (13%)	30,408 (100%)
	INBOUND	201,226 (87%)	26,944 (13%)	228,170 (100%)	13,749 (88%)	1,846 (12%)	15,595 (100%)
3	OUTBOUND	121,782 (94%)	8,163 (6%)	129,945 (100%)	13,863 (97%)	413 (3%)	14,276 (100%)
	INBOUND	115,935 (92%)	10,395 (8%)	126,330 (100%)	9,919 (96%)	402 (4%)	10,321 (100%)
4	OUTBOUND	152,558 (91%)	15,440 (9%)	167,998 (100%)	16,630 (96%)	700 (4%)	17,330 (100%)
	INBOUND	155,193 (92%)	12,726 (8%)	167,919 (100%)	13,322 (96%)	603 (4%)	13,925 (100%)

LEGEND

INBOUND 31053 • TOTAL PERSONS

% AUTO — % TRANSIT

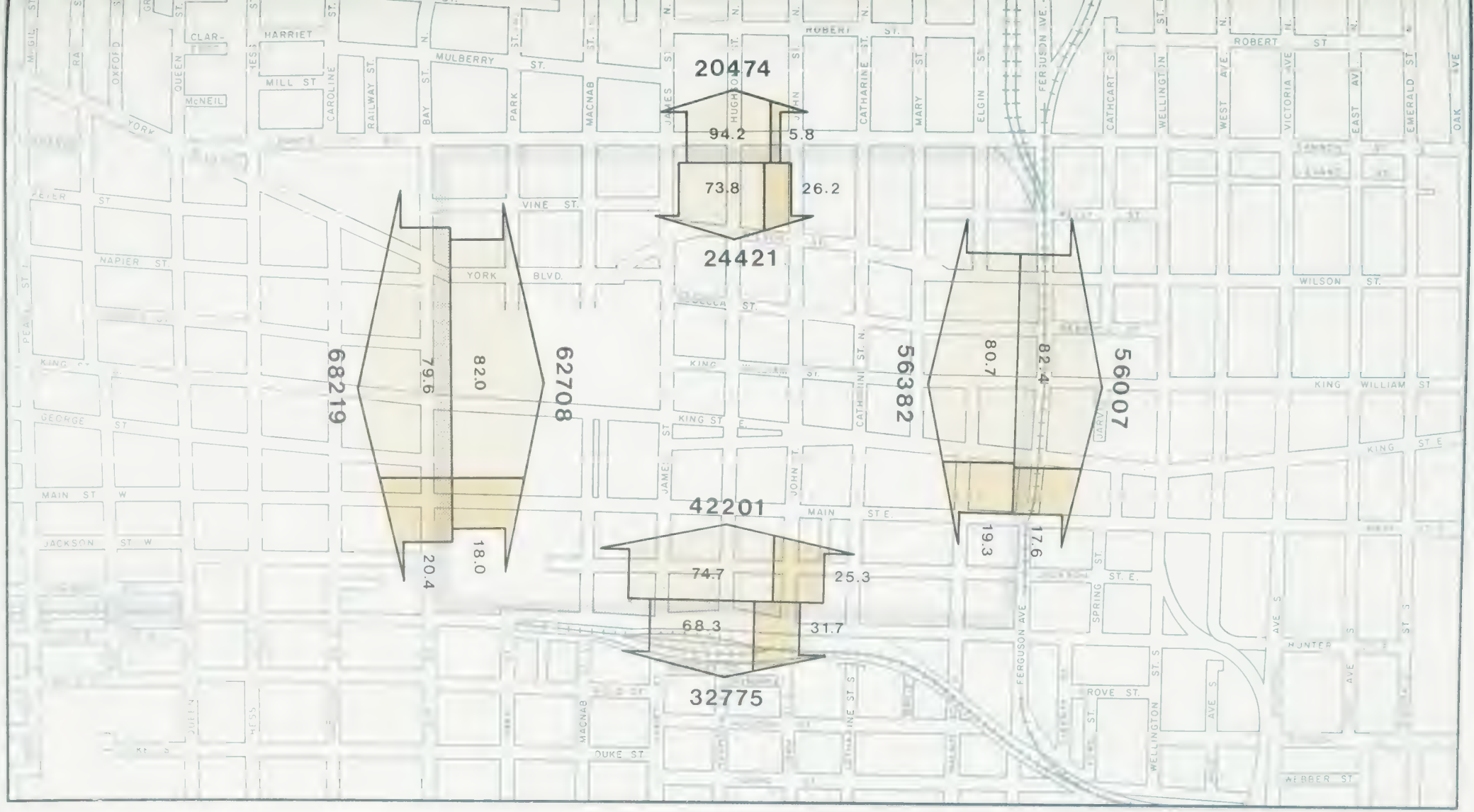
% AUTO — % TRANSIT

OUTBOUND 34842 • TOTAL PERSONS

EXHIBIT 3.5

PERSONS CROSSING OUTER CORDONS 6:30 A.M.-11:30 P.M.

Planning & Development Department
Hamilton - Wentworth Region



LEGEND

INBOUND

20474 — TOTAL PERSONS

% AUTO — % TRANSIT

% AUTO — % TRANSIT

OUTBOUND

24443 — TOTAL PERSONS

EXHIBIT 3.6

PERSONS CROSSING DOWNTOWN CORDON 6:30 A.M. - 11:30 P.M.

Planning and Development Department
Hamilton-Wentworth Region

LEGEND

INBOUND 31053 • TOTAL PERSONS

% AUTO • • % TRANSIT

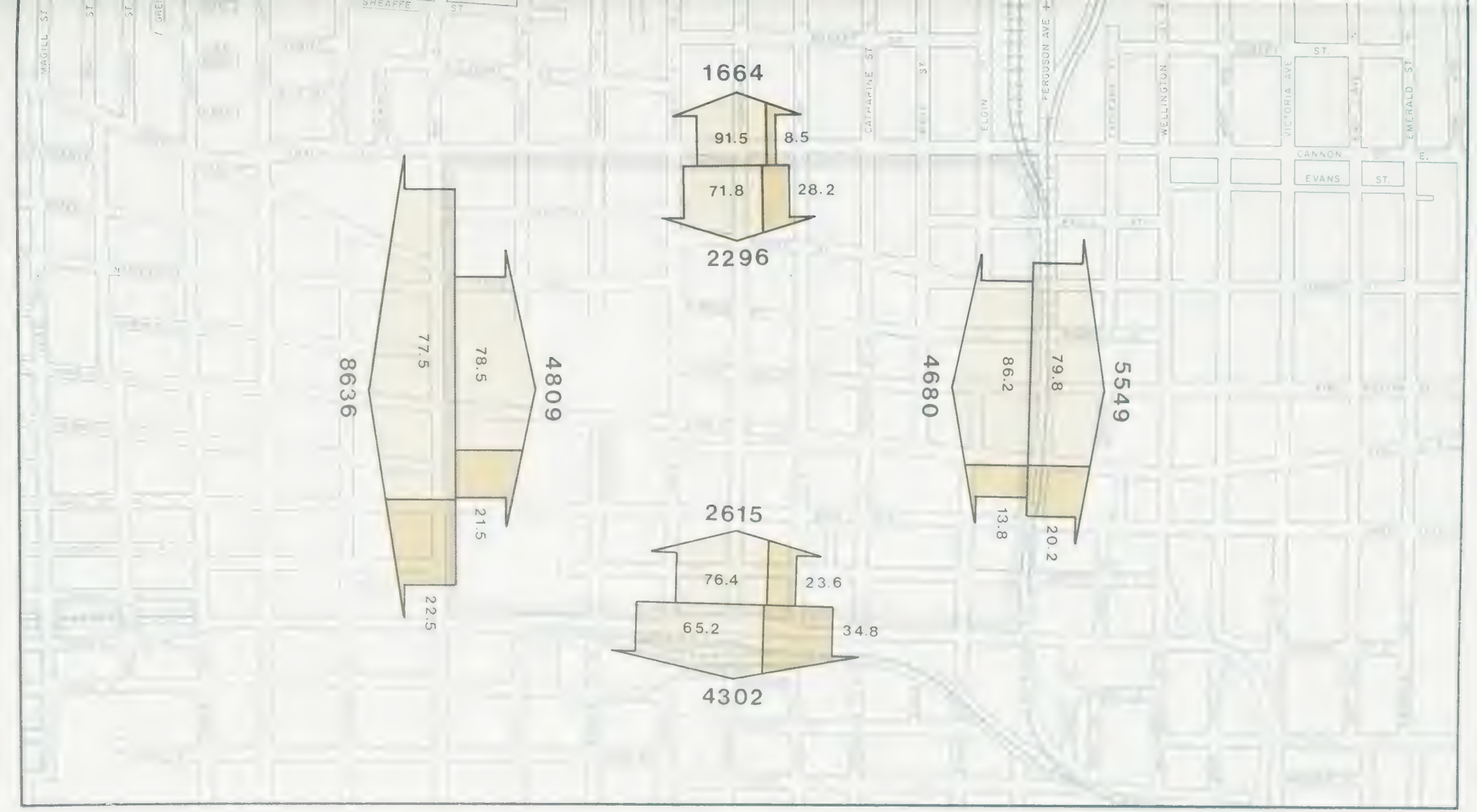
% AUTO • • % TRANSIT

OUTBOUND 34842 • TOTAL PERSONS

EXHIBIT 3.7

PERSONS CROSSING OUTER CORDONS 4:30 P.M. - 5:30 P.M.

Planning & Development Department
Hamilton – Wentworth Region



LEGEND

INBOUND 2047 — TOTAL PERSONS

% AUTO — % TRANSIT

% AUTO — % TRANSIT

OUTBOUND 2443 — TOTAL PERSONS

EXHIBIT 3.8

PERSONS CROSSING DOWNTOWN CORDON 4:30 P.M.-5:30 P.M.

Planning and Development Department
Hamilton-Wentworth Region

3.3 Travel Characteristics

Characteristics of trip makers, including auto occupancy, transit usage and hourly variation, were determined from the cordon count data. Table 3.3 provides a summary of auto occupancy and modal split by cordon and direction, for the 17-hour count period and for the p.m. peak hour. Exhibit 3.9 shows graphically the hourly variation in vehicle volumes, with total two-way volumes by cordon, plotted against time. The following observations were made regarding travel characteristics:

- The 17-hour auto occupancy is highest for Cordon 3 (1.48 persons per auto) and lowest for Cordon 1 (1.38). For the region as a whole, the average auto occupancy is 1.42, calculated by totalling all stations. On Cordons 3 and 4, Provincial highways have slightly higher auto occupancies than other roads counted.

- The p.m. peak hour auto occupancy is approximately 5% lower than the 17-hour occupancy for all cordons. Cordon 3 is the highest, averaging 1.43 persons per auto, and Cordon 2 the lowest at 1.31. The overall occupancy for the p.m. peak hour is 1.33 for outbound and 1.37 for inbound trips.

- The 17-hour modal split, or percentage of persons using transit for their trips, is highest for the downtown cordon (about 20%) and lowest for the two outer cordons (about 8%).

- The p.m. peak hour modal split is similarly highest for the downtown cordon (about 23%), and lowest for the two outer cordons (about 4%).

- The morning peak period occurs from about 7:00 a.m. to 9:00 a.m., as shown on Exhibit 3.9.

- The mid-day traffic is relatively low and stable, increasing gradually from 9:00 a.m. to 2:00 p.m. A slight noon hour peak is noted at Cordons 1 and 4.

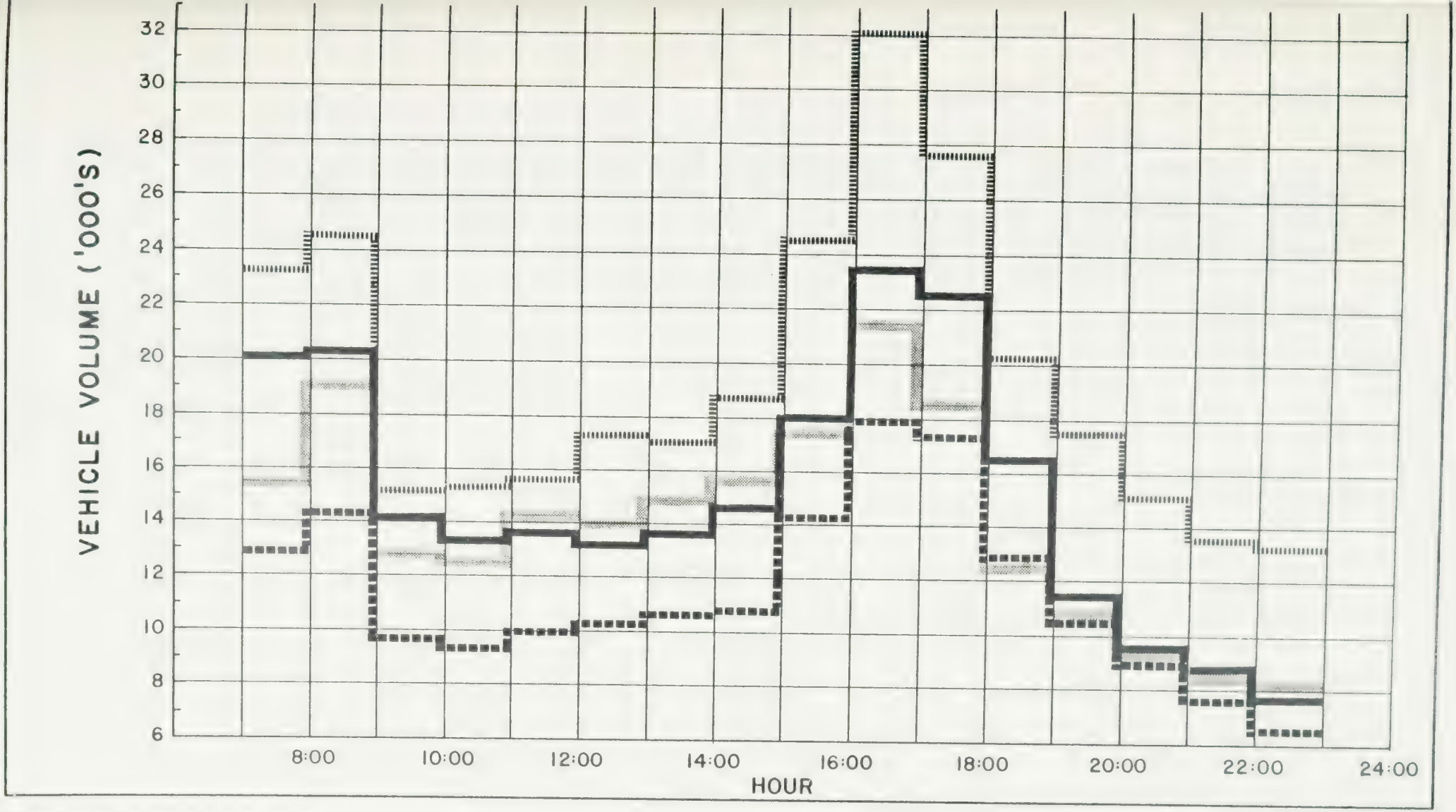
- The afternoon peak period occurs between 3:00 p.m. and 6:00 p.m. This peak has higher volumes than the morning peak, and is also spread over a longer time. The highest volumes occur during the hour starting at 4:00 p.m. At Cordons 3 and 4, the afternoon peak lasts longer, from 4:00 p.m. to 6:00 p.m.

- In the evening, traffic volumes decrease steadily from 6:00 p.m. to 11:00 p.m.

TABLE 3.3

AUTO OCCUPANCY AND MODAL SPLIT BY CORDON

CORDON	DIRECTION	17 HOUR (6:30 a.m. - 11:30 p.m.)		P.M. PEAK HOUR (4:30 p.m. - 5:30 p.m.)	
		AUTO OCCUPANCY	MODAL SPLIT	AUTO OCCUPANCY	MODAL SPLIT
1	OUTBOUND	1.38	19.9%	1.34	23.3%
	INBOUND	1.39	21.1%	1.33	20.4%
2	OUTBOUND	1.39	13.0%	1.31	13.5%
	INBOUND	1.39	11.8%	1.35	11.8%
3	OUTBOUND	1.48	6.3%	1.36	2.9%
	INBOUND	1.45	8.2%	1.43	3.9%
4	OUTBOUND	1.45	9.2%	1.34	4.0%
	INBOUND	1.45	7.6%	1.38	4.3%



LEGEND

- CORDON 1
- CORDON 2
- CORDON 3
- CORDON 4

NOTE: Volumes represent two-way totals.

EXHIBIT 3.9

HOURLY VEHICLE DISTRIBUTION

Planning and Development Department
Hamilton-Wentworth Region

3.4 Cordon Summary

This section brings together all the key results for each cordon, in order to develop a better understanding of travel patterns for the downtown and other areas.

Cordon 1

Approximately 70% of traffic travelling into, out of, or through the downtown is oriented in an east-west direction. In the p.m. peak hour, 44% of the traffic travelling out of the downtown is heading west.

Over the 17-hour period, the number of vehicles travelling in the inbound and outbound directions is approximately equal. Traffic is predominantly outbound during the p.m. peak hour. The highest directional peaking occurs at the western approach, where 63% of traffic is outbound from the downtown. The northern approach is the only exception, where 54% of traffic is inbound.

Transit plays a significant role in transporting people into and out of the downtown, with 4,780 bus crossings in the 17-hour period, and over 74,000 persons riding those buses. The modal split, or the percentage of person trips utilizing transit across the screenline, is approximately 20% over 17 hours and 22% in the p.m. peak hour. Approximately 60% of the buses, and 62% of the bus passengers, cross the cordon in an east-west direction. Another 33% of the buses and 28% of the bus passengers are crossing the cordon to the south.

There are 19,786 trucks which account for 9% of all the vehicles crossing Cordon 1 in the 17-hour period. Seventy-five percent of this truck traffic is oriented east-west across the cordon, with less than 10% crossing the southern portion of the cordon. In the p.m. peak hour, trucks account for 5% of all traffic crossing the cordon.

This is the only cordon where taxis play a noticeable role, with approximately 2,400 taxis counted crossing the cordon in the 17-hour period which account for 1% of the traffic. Fifty-eight percent of the taxis cross the cordon in an east-west direction.

Cordon 2

For the 325,828 vehicles travelling into, out of, or through the lower central city in the 17-hour period, the direction of approach is divided nearly evenly among the east, the west and the south. In the peak hour, 37% of the vehicles travelling out of this area are travelling south, with 31% travelling east, and 31% travelling west.

Traffic is predominantly outbound in the p.m. peak hour, especially at the southern approach, where 73% of traffic is outbound. At the eastern and western approaches, outbound traffic accounts for 63% and 60% of traffic, respectively.

Transit plays an important role, carrying 13% of the persons crossing this cordon in both the 17-hour and the p.m. peak hour periods. Of the 4,285 buses crossing this cordon in the 17-hour period, approximately 44% are oriented towards the south, carrying 47% of the 57,937 transit passengers crossing the cordon. Transit carries 17% of all trips crossing this cordon to the south.

Trucks account for 27,367, or approximately 9% of the vehicles crossing the cordon. Approximately 80% of the trucks cross the cordon in the east-west direction with only 20% crossing the southern portion of the cordon.

Cordon 3

At the urban boundary, there are 191,191 vehicle crossings over the 17-hour period, with 40% oriented to the east, 36% to the west, and 24% to the south. In the p.m. peak hour, there is a slightly higher orientation toward the west.

Transit accounts for only 7% of the person trips across the cordon, or 18,558 persons over the 17 hour period. The modal split drops to 3% in the p.m. peak hour. Appproximately 42% of the transit riders and 37% of the buses, are oriented to the west, with 34% of riders and 35% of the buses oriented toward the east. The remaining 24% of riders and 28% of buses are oriented toward the south.

Trucks account for 14% of the vehicles crossing this screenline in the 17-hour period, and 8% in the p.m. peak hour. Forty-two percent of the trucks cross the eastern portion of the cordon, 38% cross the west, and only 20% cross the southern portion.

Approximately 78% of all vehicles crossing this cordon are on Provincial highways, with 85% of the trucks and 75% of the buses using Provincial highways to cross the cordon.

Cordon 4

There are 252,000 vehicles crossing the Regional Boundary in the 17-hour period. Twenty-six percent of these vehicles cross at the Beach Strip, 35% cross the eastern Regional Boundary into Burlington, 20% are oriented east toward Niagara, 11% south toward Haldimand-Norfolk, and 8% toward the west. The orientation is divided nearly the same in the p.m. peak hour.

Transit accounts for 8% of the person trips crossing the cordon in the 17-hour period, and only 4% of person trips in the p.m. peak hour. Approximately 65% of the transit trips cross the cordon at the Beach strip or the eastern Regional boundary with Burlington.

Trucks account for 15% of all the vehicles crossing the Regional boundary in the 17-hour period, and 9% in the p.m. peak hour period. Fifty-eight percent of these trucks are oriented toward Burlington and points beyond. Only 13% of the trucks are oriented south toward Haldimand-Norfolk.

Over 82% of all vehicles, 90% of trucks, and 85% of transit vehicles cross the cordon on Provincial highways.

3.5 Growth Comparison

The 1981 Cordon Count data was compared with traffic count data for several previous years to determine growth trends. This comparison was done for 24-hour and p.m. peak hour vehicle volumes, for the years 1977, 1979 and 1981.

This analysis of growth in traffic over time was based on a review of vehicle volumes only, not person volumes, because comprehensive person travel data for previous years was unavailable. The resulting trends in vehicle volumes may be affected by unidentified changes in travel characteristics such as modal split or auto occupancy.

Since 1981 was the first year that a comprehensive cordon study was conducted using these counting locations, comparable past data had to be developed from a number of sources including:

- Regional Planning Department
  External Travel Impacts Study, 1976

- City of Hamilton Traffic Department
  ATR counts, 1977 - 1981
  Manual Intersection Counts, 1977 - 1981

- Ministry of Transportation and Communications
  Annual Traffic Volumes, 1977 - 1981

- Regional Engineering Department
  Volumes on Regional Roads, 1977 - 1981

It was necessary to make several adjustments to bring the various sources of data to a common base. The 1981 Cordon Count volumes were factored up from the 17-hour count period to the total 24-hour day. Traffic Department data was adjusted for seasonal and daily variation, in the cases where this had not already been done, using accepted practices and factors as explained in Appendix G. Future cordon counts will be conducted in a manner similar to this one and will be directly comparable without the need for factoring data.

The 24-hour and p.m. peak hour vehicle volumes for the years 1977, 1979 and 1981 are indicated in Table 3.4 for each cordon and direction of travel. The percentage of growth between each comparison year is also noted.

The following are some general observations concerning the growth data:

- For all cordons in the outbound direction, the total growth rate over the five-year period is 11% for 24-hour and 4% for p.m. peak hour. This translates into an average annual growth rate of 3% for 24-hour, and 1% for the p.m. peak hour.

- For all cordons in the inbound direction, traffic shows an increase of 4% for 24-hour, and a decrease of 3% for the p.m. peak.

- Growth rates vary among cordons, with more growth generally in the 24-hour than the p.m. peak hour, and more growth at the outer cordons than for the downtown or urban area.

- Cordon 1, Downtown Hamilton, displays a slight negative growth trend, averaging about 1% per year between 1977 and 1981. The decrease is most noticeable for the p.m. peak hour, inbound direction.

- Cordon 2, Lower Central Hamilton, shows a positive growth in traffic volumes of less than 1% per year for the outbound direction. The inbound direction indicates higher growth for the 24-hour, and no growth for the p.m. peak hour period.

- Cordon 3, Urban Area, displays high growth rates in the outbound direction of about 4% per year for the 24-hour and 8% per year for the p.m. peak. The inbound direction shows a fairly high growth for the 24-hour and a decrease for the p.m. peak.

TABLE 3.4

VEHICLE VOLUMES - GROWTH BY CORDON

CORDON	DIRECTION	24 HOUR						P.M. PEAK HOUR					
		1977		1979		1981		1977		1979		1981	
1	OUTBOUND	130,496	(-4.9%)	124,047	(2.8%)	127,581		12,883	(-4.0%)	12,365	(-0.7%)	12,277	
	INBOUND	133,280	(-0.6%)	132,443	(-2.6%)	128,983		11,149	(-0.3%)	11,114	(-15.2%)	9,426	
2	OUTBOUND	176,910	(0.1%)	177,153	(2.5%)	181,603		20,730	(6.3%)	22,047	(-3.9%)	21,174	
	INBOUND	156,620	(7.7%)	168,628	(4.8%)	176,801		11,010	(3.7%)	11,414	(-3.1%)	11,060	
3	OUTBOUND	91,684	(1.4%)	92,964	(15.0%)	107,043		8,757	(18.1%)	10,342	(8.1%)	11,177	
	INBOUND	91,122	(2.5%)	93,378	(10.6%)	103,268		9,989	(-15.1%)	8,481	(-7.3%)	7,858	
4	OUTBOUND	113,891	(16.4%)	132,439	(14.8%)	152,005		15,255	(-6.1%)	14,320	(6.4%)	15,237	
	INBOUND	113,840	(16.0%)	132,080	(16.8%)	154,233		12,956	(-5.7%)	12,215	(-2.3%)	11,937	

- Cordon 4, Regional Boundary, displays the highest growth rates of any cordon for the outbound direction. These are 8% per year for the 24-hour and 9% per year for the p.m. peak. The inbound direction indicates zero or negative growth.

To verify the declining traffic volumes noted for the downtown cordon, some additional analysis was undertaken. Traffic volume data for the past ten years was obtained, and summarized in a format comparable to the five-year data.

The results of this long-term analysis indicated that:

- from 1969 to 1972, volumes decreased substantially at the downtown cordon

- from 1972 to 1977, there was a period of growth which restored volumes approximately to their 1969 levels

- from 1977 to 1981, a slight decline in volumes was noted

As a result, 1981 traffic volumes in the downtown are at about the same level as they were in 1970, and the slight negative growth trend for the past five years does not necessarily reflect a long-term trend.

APPENDICES

APPENDIX A

CORDON AND SCREENLINE DESCRIPTIONS

Primary Cordon Description

1. Downtown Cordon: This cordon surrounds the high intensity residential, commercial and retail activity centre of Hamilton's Downtown Core. The cordon is formed utilizing Cannon Street in the north, the T.H. & B. Railway in the south, Ferguson Avenue in the east, and Bay Street in the west. In order to capture travel related specifically to this area of intense urban activity, the cordon is located on the interior side of the streets used to define this boundary.

2. Lower Central Hamilton Cordon: This cordon surrounds the older section of the lower City and contains both the C.B.D. and the Bay Front Industrial Area. This area is bounded by Hamilton Harbour in the north, the Niagara Escarpment in the south, the Red Hill Creek Valley in the east and Highway 403 in the west. In order to capture all travel related to this area, the cordon is located on the east side of Highway 403.

3. Urban Boundary Cordon: This cordon surrounds the lands located within Hamilton-Wentworth that are designated to develop at urban densities in the Regional Official Plan. All of this area is anticipated to be developed on the basis of urban services at some time in the future. The boundary is defined by Dewitt Road, the Niagara Escarpment, Highway 20 and Highway 53 in the Town of Stoney Creek, Highway 53 (Rymal Road) in the City of Hamilton, Highway 53, the boundary between Lots 40 and 41, and the T.H. & B. Railway in the Town of Ancaster, the westerly extent of suburban development and the Niagara Escarpment in the Town of Dundas, and Highway 6 and Parkside Drive in Waterdown (Flamborough). To capture travel related to the interior of this cordon, all stations are located on the inside of the boundary defined above.

4. Regional Boundary Cordon: This cordon is located on the boundary of the Region of Hamilton-Wentworth. Stations are located within the Region, as close to the boundary as possible.

Secondary Screenlines

2A Gage Avenue: This screenline was established to examine traffic flows in the east-west corridor east of the Hamilton downtown. Stations are located west of Gage Avenue.

3A Lower Stoney Creek: This screenline was established to identify the traffic flow patterns between continuous suburban development in east Hamilton and west Stoney Creek. Stations are located along the west side of Gray's Road on Centennial Drive and along the north side of Highway #8 in Stoney Creek.

3B Upper Stoney Creek: This screenline was established to examine the characteristics of traffic entering the Saltfleet Community from east Hamilton Mountain. Stations are located on the west side of Pritchard Road.

3C Upper Gage Avenue: This screenline is necessary to examine the cross-mountain flow of traffic. Stations are located west of Upper Gage Avenue.

3D West Fifth Street: This screenline is necessary to compile information in the east-west flow of traffic west of the central mountain access routes, including the Claremont Access, West Fifth Street ramp, and James Mountain Road. Stations are located west of West Fifth Street.

3E East Ancaster: This screenline is necessary to identify the inter-municipal traffic flows from West Hamilton Mountain to Ancaster. Stations are located close to the City of Hamilton limits.

3F North Ancaster: This screenline was established to identify the inter-municipal traffic flows from Hamilton and Dundas to Ancaster. Stations are located on the municipal boundaries.

3G West Hamilton: This screenline is necessary to identify the inter-municipal traffic flows from west Hamilton to Dundas. Again, stations are located on the municipal boundary.

LEGEND

PRIMARY CORDONS

SECONDARY CORDONS

EXHIBIT A-1

PRIMARY AND SECONDARY CORDONS

Planning & Development Department

Hamilton-Wentworth Region

APPENDIX B

COUNTING STATION LOCATION DETAILS

STA NO.	LOCATION	DATE (1981)	CORDON	SCREEN LINE
1	Hunter St. west of Ferguson Ave.	Mon. May 11	1	38
2	Main St. west of Ferguson Ave.	Tues.May 12	1	38
3	King St. west of Ferguson Ave.	Thur.May 7	1	38
4	Wilson St. west of Ferguson Ave.	Tues.May 12	1	38
5	Cannon St. west of Ferguson Ave.	Mon. May 11	1	38
6	Ferguson Ave. south of Cannon St.	Wed. May 6	1	37
7	Catharine St. south of Cannon St.	Mon. May 11	1	37
8	John St. south of Cannon St.	Thur.May 7	1	37
9	James St. south of Cannon St.	Thur.May 7	1	37
10	Bay St. south of Cannon St.	Wed. May 6	1	37
11	Cannon St. east of Bay St.	Wed. May 6	1	40
12	York Blvd. east of Bay St.	Wed. May 6	1	40
13	King St. east of Bay St.	Tues.May 5	1	40
14	Main St. east of Bay St.	Tues.May 5	1	40
15	Hunter St. east of Bay St.	Tues.May 5	1	40
16	Bay St. north of Hunter St.	Mon. May 4	1	39
17	James St. north of Hunter St.	Mon. May 4	1	39
18	John St. north of Hunter St.	Mon. May 4	1	39
19	Catharine St. north of Hunter St.	Mon. May 4	1	39
20	Ferguson Ave. north of Hunter St.	Mon. May 11	1	39
21	King St. west of Mt. Albion Rd.	Wed. May 13	2	20
22	Queenston Rd. west of Potruff	Wed. May 13	2	20
23	Barton St. east of Potruff	Thur.May 14	2	20
24	Burlington St. west of Woodward	Thur.May 14	2	26
25	York St. east of Dundurn	Wed. May 13	2	18
26	King St. east of Hwy #403	Tues.May 19	2	18
27	Aberdeen Ave.(Longwood)east of Hwy 403	Wed. May 20	2	18
28	Garth St. north of Fennell Ave.	Wed. May 20	2	15
29	James Mtn. Rd. south of Gateview	Tues.May 19	2	15
30	Jolley Cut at Concession	Thur.May 19	2	15
31	Sherman Cut at Sherman Access	Tues.May 19	2	16
32	Kenilworth Access at Mtn. Brow	Thur.May 21	-	16
33	Cumberland Ave. at Gage Ave.	Wed. May 20	-	35
34	Main St.E. west of Gage Ave.	Thur.May 21	-	35
35	King St.E. west of Gage Ave.	Mon. May 25	-	35
36	Cannon St.E. west of Gage Ave.	Mon. May 25	-	35
37	Barton St. west of Gage Ave.	Tues.May 26	-	35
38	Beach Rd. west of Gage Ave.	Mon. May 25	-	35
39	Burlington St. west of Gage Ave.	Tues.May 26	-	35
40	Industrial Dr. west of Gage Ave.	Wed. May 27	-	35

41	Dewitt Rd. at Ridge Rd.	Mon. June 1	3	17
42	Hwy #8 west of Dewitt Rd.	Mon. June 1	3	36
43	Barton St. west of Dewitt Rd.	Mon. June 1	3	36
44	N.Service Rd. west of Dewitt Rd.	Mon. June 1	3	36
45	Q.E.W. east of Fruitland Rd.	Thur.May 28	3	36
46	Q.E.W. at Toll Plaza*	Thur.May 28 Thur.June 18	4	24
47	Beach Blvd. east of Lift Bridge	Wed. May 27	4	24
48	Hwy #6 south of Hwy #5(Clappison Cor.)	Wed. May 27	3	7
49	Sydenham Rd. at Escarpment	Mon. June 1	3	9
50	Hwy #8 at C.N.R. Underpass(Dundas)	Tues.June 2	3	9
52	Hwy #99 at Bridlewood	Mon. June 1	3	-
53	Jerseyville Rd. at Valleyview*	Mon. June 1 Thur.June 18	-	-
54	Hwy 403 at Hwy #2*	Tues.June 2 Thur.June 18	-	-
55	Fiddlers Green north of Hwy 53	Tues.June 2	3	10
56	Hwy #53 east of Fiddlers Green	Tues.June 2	3	-
57	Southcote Rd. north of Hwy #53	Tues.June 2	3	10
58	Upper Paradise north of Rymal Rd.	Mon. May 11	3	11
59	Upper James north of Rymal Rd.	Wed. June 3	3	11
60	Upper Gage north of Rymal Rd.	Wed. June 3	3	11
61	Upper Ottawa north of Rymal Rd.	Wed. June 3	3	11
62	Hwy #20 north of Hwy #53	Wed. June 3	3	12
63	Hwy #53 west of Hwy #20	Thur.June 4	3	12
64	Mud St. west of Hwy #20	Wed. June 3	3	12
66	New Mountain Rd. at Ridge Rd.	Thur.June 4	3	17
69	Queenston Rd. west of Hwy #20	Mon. June 15	-	-
70	Hwy #20 north of King St.E.	Mon. June 25	-	-
71	Mount Albion Rd. north of Mud St.	Tues.June 16	2	16
72	Mud St. west of Pritchard	Tues.May 12	-	14
73	Stone Church Rd. west of Pritchard	Wed. May 20	-	14
74	Rymal Rd. west of Pritchard	Thur.May 21	-	14
75	Rymal Rd. west of Upper Gage	Thur.May 14	-	32
76	Stone Church Rd. west of Upper Gage	Thur.May 14	-	32
78	Mohawk Rd. west of Upper Gage	Tues.June 16	-	32
79	Fennell Ave. west of Upper Gage	Tues.June 16	-	32
81	Rymal Rd. west of West 5th	Mon. May 25	-	31
82	Stone Church Rd. west of West 5th	Tues.May 26	-	31
83	Mohawk Rd. west of West 5th	Wed.June 17	-	31
84	Fennell Ave. west of West 5th	Wed.June 17	-	31
85	Rymal Rd. east of Glancaster Rd.	Tues.June 2	-	13
86	Mohawk Rd. east of Hwy #403	Wed. June 17	-	13
87	Hwy #403 Exit ramps at Mohawk Rd.	Wed. June 14	-	-
88	Hwy #2 at Triple Rinks	Tues.May 26	3	25
89	Binbrook Rd. at Regional Boundary	Thur.June 4	4	2
90	Hwy #20 at Regional Boundary	Thur.June 4	4	2
91	Mud St. at Regional Boundary	Thur.June 4	4	2

92	Ridge Rd. at Regional Boundary	Thur.June 4	4	2
93	Hwy #8 at East Regional Boundary	Mon. June 8	4	1
94	Q.E.W. at Fifty Road	Mon. June 8	4	1
97	Plains Rd. at Regional Boundary	Mon. June 8	4	8
98	Waterdown Rd. south of Hwy #5	Thur.June 11	4	7
99	Hwy #403 at Hwy #6	Tues.June 9	4	8
100	Hwy #5 at E. Regional Boundary	Tues.June 9	4	6
101	#1 Side Rd. at Regional Boundary	Thur.June 4	4	6
102	RR #7(Carlisle Rd) at Reg'l Boundary	Thur.June 4	4	6
103	Campbellville Rd. at Regional Boundary	Wed. June 10	4	6
104	Hwy #6 at North Regional Boundary	Wed. June 10	4	5
105	Hwy #52 at North Regional Boundary	Wed. June 10	4	5
106	Hwy #97 at West Regional Boundary	Wed. June 10	4	5
107	Hwy #8 at West Regional Boundary	Wed. June 10	4	5
108	Hwy #5 at West Regional Boundary	Wed. June 10	4	4
109	Hwy #99 at West Regional Boundary	Thur.June 11	4	4
110	Jerseyville Rd. at Regional Boundary*	Mon. June 15 Tues.June 16	4	4
111	Hwy #2 at West Regional Boundary	Tues.June 9	4	4
112	Sawmill Rd. at South Regional Boundary	Mon. June 15	4	4
113	Hwy #6 at South Regional Boundary	Thur.June 4	4	3
114	Hwy #56 at Regional Boundary	Thur.June 4	4	3
117	Cootes Drive at Olympic Drive	Thur.June 11	-	-
118	Main St.E. east of Osler Dr.	Thur.June 11	-	-
119	Hwy #5 east of Hwy #6	Wed. June 10	-	-
120	Hwy #52 at Hwy #99	Mon. June 10	-	10
122	Main St.W. east of Hwy #403	Thur.June 19	2	18
123	Derry Road at Town line	Thur.June 4	-	-
130	Hwy #56 south of Hwy #20	Thur.June 19	-	-

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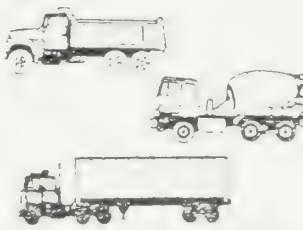
* Counts were conducted over a period of more than one day, due to staffing or other problems.

APPENDIX C

VEHICLE CLASSIFICATION SYSTEM

CLASSIFICATION	DESCRIPTION	EXAMPLES
AUTOMOBILES - AUTOS	passenger cars, station wagons, rancheros, jeeps, vans & pick-up trucks (private), cars with trailers.	
- CAB	Taxis and airport limousines	
TRUCKS - LIGHT	vans,pick-ups, small panels,rancheros, station wagons (commercial),jeeps (service station type),ambulance, police cars, public utility cars, hearses, etc.	
- MEDIUM	2 AXLES ONLY (dual rear tires) delivery trucks (Simpsons type), dump trucks, mail trucks, tow trucks, moving trucks, etc.	
- HEAVY	MORE THAN 2 AXLES dump trucks, tow trucks, cement trucks, oil trucks, moving trucks,delivery trucks, tractor-trailer trucks.	
TRANSIT VEHICLES - BUS	Local (HSR/Municipal) buses, large and small.	
- TROLLY	Trolly coaches (bus with electrical Pickup	
- OTHER (bus)	ALL BUSES OTHER THAN LOCAL (school bus, GO Transit, Gray Coach, Greyhound, Airport buses, Coaches, DARTS, etc) Charter.	

APPENDIX D

RECORDING FORMAT

Hamilton-Wentworth Region
Planning and Development Department
CORDON COUNT FIELD REPORT

1 OF 10 MPT 003 5/77

Location

Weather

Recorder

DIRECTION NB	SB	WB	EB	REPORT No	OF	CORDON C	O		STATION NUMBER	MONTH	DAY	A.M.	P.M.

TIME ENDING Hour	Minute	TRUCK TYPE Light	Medium	Heavy	NUMBER OF OCCUPANTS 1 Auto	1 Cab	2 Auto	2 Cab	3 Auto	3 Cab	4 Auto	4 Cab	5 Auto	5 Cab	6+ Auto	6+ Cab	TRANSIT VEHICLES HSR Routes Bus	HSR Routes Occ	HSR Trolley Car	HSR Trolley Occ	Other Bus	Other Occ
06:45																						
07:00																						
07:15																						
07:30																						
07:45																						
08:00																						
08:15																						
08:30																						

APPENDIX E

STANDARD INPUT FORMAT
&
STANDARD DATA BANK RECORD LAYOUT

NOTE: 1. Line one shows the card format for input data.

2. Lines one and two together show the output format of
   The Data items on the Data Bank.
   The corresponding Field Numbers are shown underneath.

3. Fields 35 to 44 are calculated from the input data.

   = (LOC*100000)+(DIR*10000)+TIME
   - NOT available as an input field

	KEY				TRUCKS			NO OF OCCUPANTS										H.S.R. BUSES		TROLLY BUSES		OTHER BUSSES		SUBWAY		COMMUTER RAIL		
								ONE		TWO		THREE		FOUR		FIVE		SIX											
	LOC	DIR	TIME	SPECIAL KEY (PROGRAM)	LIGHT	MED	HEAVY	AUTO	CAB	AUTO	CAB	AUTO	CAB	AUTO	CAB	AUTO	CAB	AUTO	CAB	BUS #	OCCUP	CAR #	OCCUP	BUS #	OCCUP	CAR #	OCCUP	CAR #	OCCUP	BLANK
	9 9 9	9	9 9 9 9	9 9 9 9 9	9 9 9	9 9 9	9 9 9	9 9 9 9	9 9	9 9 9	9 9	9 9 9	9 9	9 9 9	9 9	9 9 9	9 9	9 9	9 9	9 9	9 9 9	9 9	9 9 9 9	9 9	9 9 9	9 9	9 9 9 9	9 9	9 9 9 9	9
FIELD NO.	1	2	3	4	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	

	TOTAL TRUCTS	TOTAL PRIVATE AUTOS	TOTAL CABS	TOTAL PRIVATE AUTO + CABS	TOTAL VEHICLES	TOTAL PRIVATE PASSENG.	TOTAL CAB PASSENG.	TOTAL PASSENG	TOTAL TRANSIT	TOTAL PERSON TRIPS	BLANK FOR FUTURE USE
FIELD NO.	35	36	37	38	39	40	41	42	43	44	45 → 80

APPENDIX F
STANDARD TABULATIONS REPORT
NO. 1 VEHICLES

10C181 1981 CORDON COUNT REPORT 1 AND 2 PAGE 2

STANDARD REPORT NO. 1 - TOTAL VEHICLES

** AM ** STATION (66) DIRECTION (S)

TIME	TOTAL VEHICLE (EXCLUDE RAIL)	AUTOS			TRUCKS				BUSES		RAIL		
		TOTAL	PRIVATE CAR	TAXI	TOTAL	LIGHT	MED	HEAVY	MUN. TRANSIT	OTHER	STREET CARS	SUBWAY CARS	COMMUTER RAIL
0:00- 6:44	4	3	3	0	1	1	0	0	0	0	0	0	0
6:45- 6:59	5	4	4	0	1	0	1	0	0	0	0	0	0
7:00- 7:14	7	6	6	0	1	1	0	0	0	0	0	0	0
7:15- 7:29	8	7	7	0	1	0	1	0	0	0	0	0	0
7:30- 7:44	18	14	14	0	2	2	0	0	0	1	0	0	0
7:45- 7:59	10	10	10	0	0	0	0	0	0	0	0	0	0
8:00- 8:14	16	13	13	0	2	2	0	0	0	1	0	0	0
8:15- 8:29	14	14	14	0	0	0	0	0	0	0	0	0	0
8:30- 8:44	13	11	11	0	1	1	0	0	0	1	0	0	0
8:45- 8:59	13	11	11	0	2	2	0	0	0	0	0	0	0
9:00- 9:14	10	9	9	0	1	1	0	0	0	0	0	0	0
9:15- 9:29	4	4	4	0	0	0	0	0	0	0	0	0	0
9:30- 9:44	8	7	7	0	1	1	0	0	0	0	0	0	0
9:45- 9:59	5	4	4	0	1	1	0	0	0	0	0	0	0
10:00-10:14	10	9	9	0	1	1	0	0	0	0	0	0	0
10:15-10:29	13	11	10	1	2	1	1	0	0	0	0	0	0
10:30-10:44	10	10	10	0	0	0	0	0	0	0	0	0	0
10:45-10:59	6	6	6	0	0	0	0	0	0	0	0	0	0
11:00-11:14	17	14	14	0	3	2	1	0	0	1	0	0	0
11:15-11:29	12	12	12	0	0	0	0	0	0	0	0	0	0
11:30-11:44	22	22	22	0	0	0	0	0	0	0	0	0	0
11:45-11:59	20	20	20	0	0	0	0	0	0	0	0	0	0

APPENDIX F
STANDARD TABULATIONS
NO. 2 PERSON TRIPS

STANDARD REPORT NO. 2 - TOTAL PERSON TRIPS

** AM ** STATION (661) DIRECTION (E)

TIME	TOTAL PERSON TRIPS	AUTO-OCCUPANCY								TRANSIT-OCCUPANCY						
		TOTAL OCCUP	AVG. OCCUP	NUMBER OF PERSONS ONE	TWO	THREE	FOUR	FIVE	SIX	TOTAL	AVG. O.D.	BUSES LOCAL	BUSES OTHER	CARS STREET	CARS SUBWAY	COMM RAIL
0:00- 6:44	3	3	1.0	3	0	0	0	0	0	0	0.0	0	0	0	0	0
6:45- 6:59	5	5	1.2	3	2	0	0	0	0	0	0.0	0	0	0	0	0
7:00- 7:14	8	8	1.3	4	4	0	0	0	0	0	0.0	0	0	0	0	0
7:15- 7:29	10	9	1.8	5	4	0	0	0	0	1	1.0	0	1	0	0	0
7:30- 7:44	18	16	1.1	13	0	3	0	0	0	2	1.0	0	2	0	0	0
7:45- 7:59	11	11	1.1	9	2	0	0	0	0	0	0.0	0	0	0	0	0
8:00- 8:14	30	15	1.1	11	4	0	0	0	0	15	15.0	0	15	0	0	0
8:15- 8:29	20	20	1.4	9	8	3	0	0	0	0	0.0	0	0	0	0	0
8:30- 8:44	14	13	1.1	9	4	0	0	0	0	1	1.0	0	1	0	0	0
8:45- 8:59	15	15	1.3	7	8	0	0	0	0	0	0.0	0	0	0	0	0
9:00- 9:14	12	12	1.3	6	6	0	0	0	0	0	0.0	0	0	0	0	0
9:15- 9:29	5	5	1.2	3	2	0	0	0	0	0	0.0	0	0	0	0	0
9:30- 9:44	8	8	1.1	6	2	0	0	0	0	0	0.0	0	0	0	0	0
9:45- 9:59	5	5	1.2	3	2	0	0	0	0	0	0.0	0	0	0	0	0
10:00-10:14	14	14	1.5	4	10	0	0	0	0	0	0.0	0	0	0	0	0
10:15-10:29	12	12	1.0	10	0	0	0	0	0	0	0.0	0	0	0	0	0
10:30-10:44	13	13	1.3	8	2	3	0	0	0	0	0.0	0	0	0	0	0
10:45-10:59	7	7	1.1	5	2	0	0	0	0	0	0.0	0	0	0	0	0
11:00-11:14	22	22	1.5	7	12	3	0	0	0	40	40.0	0	40	0	0	0
11:15-11:29	17	17	1.4	8	6	3	0	0	0	0	0.0	0	0	0	0	0
11:30-11:44	29	29	1.3	16	10	3	0	0	0	0	0.0	0	0	0	0	0
11:45-11:59	31	31	1.5	10	18	3	0	0	0	0	0.0	0	0	0	0	0

APPENDIX G

GROWTH COMPARISON FACTORING DETAILS

1. 17-hour to 24-hour

   - o factoring up 17-hour 1981 Cordon Count data to 24-hour (6:30 a.m. - 11:30 p.m.)
   - o used 1.10, based on an average of factors obtained from Hamilton Traffic Department, for all months and all days of the week.

2. Seasonal Variation

   - o needed to factor up 1979 & 1981 Manual Intersection counts from Traffic Department to match our May/June dates.
   - o used the following factors, obtained from Traffic Department, adjusted to reflect 1.0 for May & June, and adjusted to eliminate over-weighting of January, February & March.

January	1.10	July	0.99
February	1.09	August	1.05
March	1.09	September	1.02
April	1.08	October	1.00
May	1.00	November	1.03
June	1.00	December	1.03

3. Daily Variation - Fridays

   - o needed to adjust some manual counts taken on Fridays, to reflect cordon count data obtained on Mondays to Thursdays.
   - o used inverse of 1.10, or 0.91

4. Directional Split

   - o needed to translate MTC two-way total volumes into directional volumes
   - o used 50/50 for 24-hour, and 60/40 outbound for p.m. peak hour, based on 1976 External Travel Impacts Study.

APPENDIX H

SCREENLINE SUMMARY

A screenline is an imaginary or physical boundary at which traffic crossing is counted. Earlier studies conducted by the Regional Planning Department summarized data on a screenline level of detail. These include the background studies to the Regional Official Plan, the 1976 External Travel Impacts Study and the 1979 Capital Facilities Plan. The screenlines used in these studies are indicated in Exhibit H-1.

The data from the 1981 Cordon Count has also been summarized at a screenline level of detail. Table H-1 provides, for each of 30 screenlines, the 17-hour and p.m. peak hour values for vehicle volumes, persons, percentage trucks, modal split and auto occupancy. This summary is for the peak direction only, and will be used to provide a more current source of data for on-going analyses such as the study of specific roadway and transit improvements.

It should be noted that, due to the different requirements of the Cordon Count Study, not all counting locations were exactly the same as for earlier screenline summaries. Those screenlines which differ significantly in location from earlier sources are marked separately on Table H-1.

The following observations were made from a review of the screenline data:

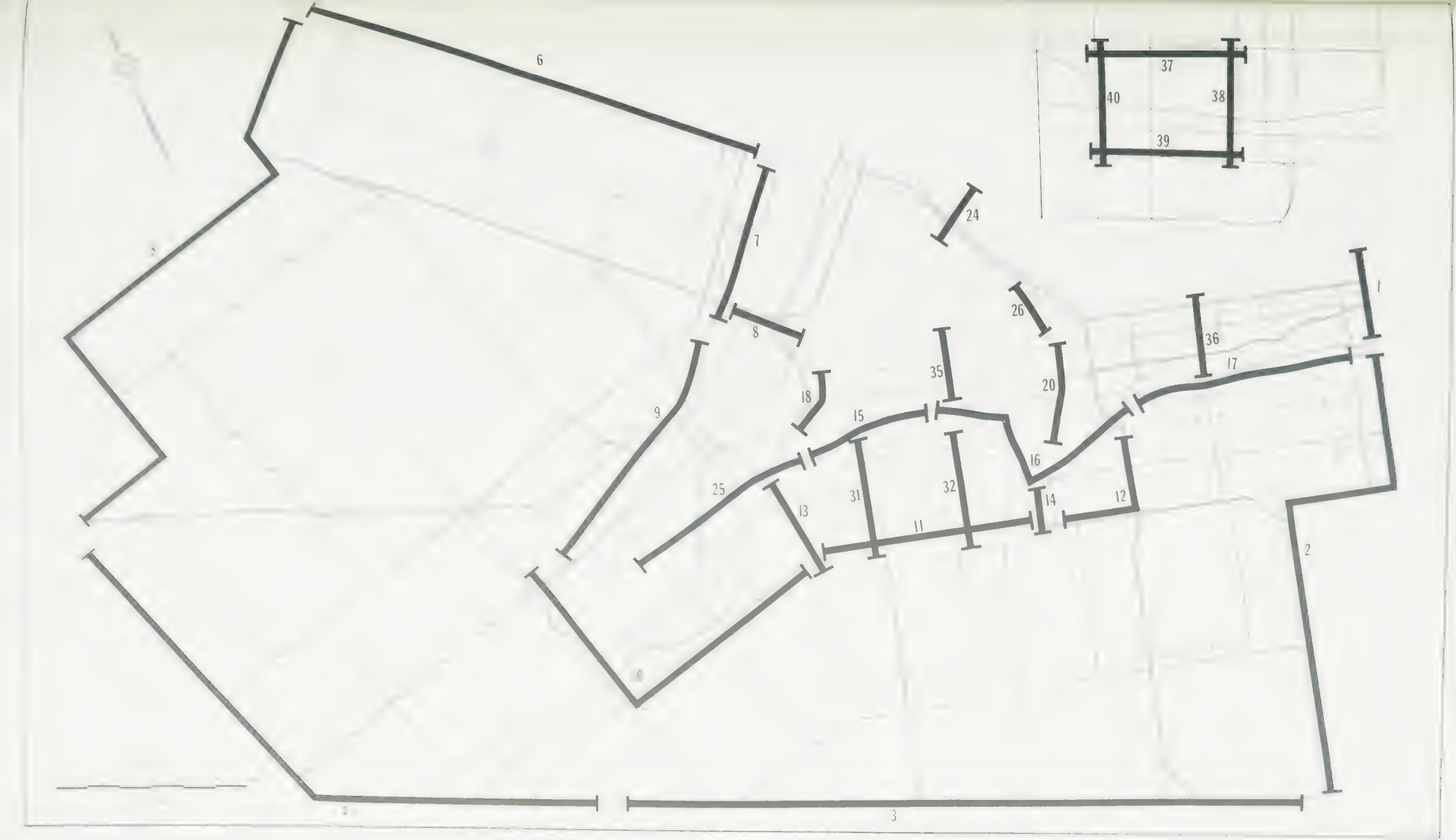
- The highest traffic concentrations are on screenlines 19, 18 and 20, which are located at the central, western, and eastern approaches to the lower city. The volumes for these screenlines are about 40,000 to 55,000 vehicles in the 17-hour period.

- P.M. peak hour vehicle volumes represent approximately 11% of the 17-hour volumes.

- Trucks represent 5% to 22% of total 17-hour vehicles and 3% to 15% of p.m. peak hour vehicles. The highest percentages of trucks are found at screenlines with Provincial highways, such as screenlines 24, 4, 5, 6 and 7.

- 17-hour person volumes are highest at screenlines 19, 18 and 20, where they represent 60,000 to 75,000 persons. These are the same screenlines which have the highest vehicle volumes.

- P.M. peak hour person volumes are highest at screenlines 18, 19, 15, 16 and 20, which are the downtown approaches and the escarpment crossings.



LEGEND

NUMBER AND LOCATION OF SCREENLINES

EXHIBIT B-1

SCREENLINES

TABLE H-1 SCREENLINE OPERATING CHARACTERISTICS

SL	DIR	1981 VOLUME		1981 % TRUCKS		1981 PERSONS		1981 MODAL SPLIT		1981 AUTO OCCUP.	
		17 HR	PM PK	17 HR	PM PK	17 HR	PM PK	17 HR	PM PK	17 HR	PM PK
1	EB	20,999	2,499	16.2	10.2	30,407	3,292	11.4	3.9	1.54	1.41
2	EB	4,464	526	11.8	7.4	6,185	725	5.5	2.9	1.49	1.41
3	SB	7,060	795	14.3	10.7	9,387	995	5.9	2.0	1.47	1.37
4	WB	9,199	921	21.7	13.5	10,934	1,084	5.5	1.8	1.44	1.36
5	WB	7,976	788	17.2	11.4	11,454	1,172	12.3	14.4	1.54	1.45
6	WB	6,078	703	11.9	10.9	7,927	859	4.4	5.1	1.43	1.31
7	NB	12,263	1,609	18.7	10.7	14,851	1,956	5.0	4.8	1.42	1.30
8	EB	36,608	4,582	11.4	6.5	48,771	5,707	7.9	6.7	1.39	1.25
9	WB	8,027	1,040	7.3	6.3	12,291	1,358	9.0	1.8	1.52	1.37
10	EB	5,150	514	14.4	9.3	6,813	682	9.6	5.0	1.42	1.32
11*	SB	13,457	1,534	9.9	5.1	19,125	2,159	6.9	7.9	1.51	1.38
12*	WB	9,203	1,106	12.2	8.6	12,691	1,424	6.5	4.6	1.48	1.35
13	EB	12,700	1,372	11.7	7.4	16,666	1,861	5.7	2.8	1.41	1.43
14	EB	11,716	1,201	12.3	7.6	15,451	1,543	5.4	.9	1.44	1.38
15	SB	29,678	4,154	5.0	3.3	52,132	7,532	26.6	28.9	1.40	1.37
16	SB	34,478	5,151	4.6	3.7	49,255	6,938	5.2	2.7	1.42	1.32
17	SB	2,626	294	7.0	4.4	3,870	392	4.2	.2	1.53	1.40
18	WB	52,189	6,667	8.7	4.1	72,973	9,054	12.2	11.6	1.36	1.26
19	EB	55,156	5,175	9.7	5.6	76,210	7,495	13.5	13.6	1.35	1.38
20	EB	41,774	4,811	6.5	3.8	61,970	6,908	9.7	8.4	1.45	1.38
24	SB	33,170	2,870	18.9	14.9	42,673	3,494	10.6	6.8	1.43	1.34
25	WB	15,467	1,645	8.2	4.2	21,079	2,257	5.9	2.5	1.44	1.33
26	EB	16,678	1,841	19.7	9.6	17,031	1,949	3.5	3.2	1.23	1.14
31*	WB	30,274	3,145	8.2	6.5	42,785	4,154	7.1	6.2	1.45	1.34
32*	EB	25,158	2,554	9.2	5.4	35,360	3,535	8.3	8.3	1.45	1.37

* Locations differ from earlier studies

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